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Comparative Evaluation Using Google Lighthouse Metric of Banking Services

Abstract

As online banking becomes increasingly crucial, the performance of banking websites plays a key role in improving customer experience. In this report, we conduct a comparative evaluation of five Malaysian banking websites which are Maybank, Standard Chartered, HSBC Bank Malaysia, RHB Bank and Bank Islam in order to look into their respective web performance, accessibility, best practices and search engine optimization (SEO). This evaluation is conducted by utilizing Google Lighthouse which is a commonly recognized web performance audit tool. From the generated performance reports' findings, we identify the strengths and weaknesses of each banking website. Additionally, this report highlights the significant differences and trends among the banking websites by comparing and contrasting the outcomes of the evaluation. In the last section of this report, we conclude our findings by suggesting several recommendations for optimization and improvement of each chosen banking website.

Introduction

In these days and age, using websites as intermediaries between clients and companies are integrated deeply in this society where rapidness and security are not compromised for their quality. Competitiveness in many of the banking services have been shaped not mainly only by the branding of the banking company, but also by the security and enhanced user experience. A successful web design of the banking websites are determined by the visual appeal, simple navigation, mobile responsiveness. accessible information and personalization. [1]

This study focuses on the five best-ranked banking services used by Malaysians as ranked by Wise.com. [10] The banks are as followed from first selected Maybank, Standard Chartered, HSBC Bank Malaysia, RHB Bank and Bank Islam for its varying level of digital presence in the Malaysian financial ecosystem.

The purpose of this evaluation is to measure the parameters of which Google Lighthouse can distinguish for all of the websites and make comparisons using weighted average of metric scores. Lighthouse is an open-source automated tool developed by Google that audits website quality in areas such as performance, accessibility, best practices, SEO, and Progressive Web App (PWA) features [2]. With the metrics, the scores given will give

insights to developers on what level of threshold they should aim to improve their website performances.

Literature Review

1. Online Banking
   Online banking is one of the platforms that can easily be used to transfer money, check the balance of a bank account without leaving the house.It also refers to the digital platforms that allow customers perform various banking activities through the internet that is provided by the bank.
2. Comparative studies
   Comparative studies are research approaches used to find and compare the similarities and differences between two or more cases, groups , systems or settings. [8] The aim is to gain a deeper understanding of how certain factors impact the result across different contexts, people or time periods. This approach is frequently used in fields such as healthcare, social sciences, education and even technology to assess how context or system variances affect outcomes.
3. User experience(UX)
   User experience or UX is a way a user interacts with and experiences a system, product or service. There are 7 principles of user experience(UX) which are usefulness,desirability,accessibility,credibility, findability, usability and value-impact.[9]
4. Metrix Google LightHouse
   Google LightHouse is an open-source tool that Google created to evaluate the quality of websites with an emphasis on performance, accessibility, best practices, SEO and Progressive Web Apps (PWA). The main output is the Performance Score, which ranges from 0 to 100. Developers may understand better how quickly and smoothly a web page loads and becomes useful by using this metric. Metrix Google LightHouse becomes a central part of how websites are assessed for speed and responsiveness.
5. Search Engine Optimization(SEO)
   Search Engine Optimization or SEO is one of marketing tactic that used to increase a website's visibility on search engines such as Google or Bing.[7]
   The main goal is to rank on the first page of search results by targeting the most significant and relevant keywords for your audience. This will attract the right visitors to your website. As technology and use behaviour evolve, SEO has grown more dynamic, adapting to voice searches, mobile uses and even AI-generated summaries in search results.[7]

Methodology

In this study, we gather related information from some online sources like articles and journals. The process of data collection is done by using Google Lighthouse which is able to generate a performance report for each of the selected banking websites. Google Lighthouse audits each website across several major metrics:

1. Performance which measures responsiveness, page load speed and visual stability of the website.

2. Accessibility which evaluates how accessible the banking website is to users and also some accessing factors.
3. Best practices which examines the adherence of each banking website to current modern web development best practices.
4. Search engine optimization (SEO) which analyzes factors such as mobile-friendliness and use of structured data.

For each of the evaluated metrics, Google Lighthouse offers a score ranging from 0 to 100. A score of 0 to 49 indicates poor performance, a score of 50 to 89 indicates intermediate performance that can be significantly optimized and a score of 90 to 100 indicates good performance.

After that, the collected data from the generated reports is analyzed. We conduct quantitative analysis by recording and comparing the numerical scores for each metric across the five banking websites. Besides, we also conduct comparative analysis by comparing the score and specific audit findings among the five websites for the purpose of examining relative strengths and weaknesses. Lastly, the results and findings of the analyzed data are documented in a holistic report which includes charts and visualizations to show the comparative performance of the five banking websites.

Result and Discussion

Based on the data collected on April 10, 2025, the scores from the scanned results from Google Lighthouse for all banks in our interests are as follows:

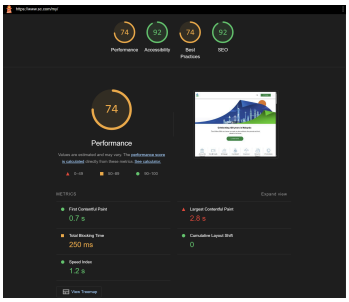


Fig. Standard Chartered Audit Result

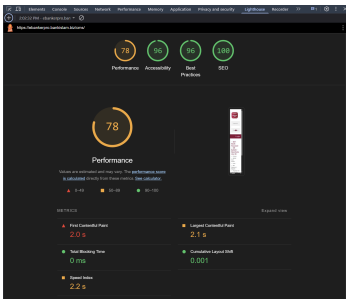
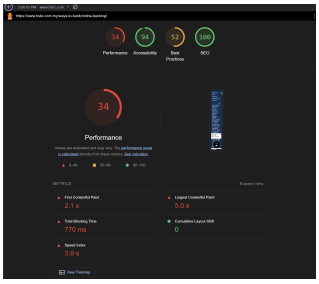
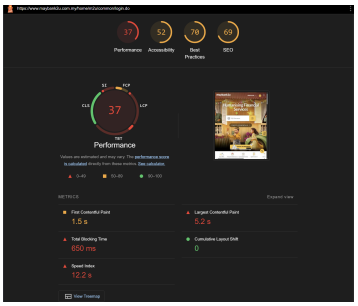


Fig. Bank Islam Audit Result

Based on the audit results for Standard Chartered and Bank Islam, the metric scores for both websites were either orange or green. These scores indicate that the websites either require improvement (orange) or are performing well (green) [2]. In terms of performance, both banks received orange scores due to issues related to First Contentful Paint, Largest Contentful Paint, Total Blocking Time, and Speed Index. While the websites are not excessively slow, the loading times are moderate and could benefit from optimization. For the accessibility metric, both websites achieved green scores, suggesting that most elements are accessible and well-integrated for users and developers alike. However, some issues were identified—for instance, Bank Islam's website had insufficient color contrast between the background and certain elements. For Best Practices metric, Standard Chartered received an orange score. This was mainly due to the use of third-party cookies, which are increasingly discouraged as browsers like Chrome move toward technologies that limit or eliminate their use. Lastly, both websites received green scores in the SEO metric.

Notably, Bank Islam achieved a perfect score of 100, whereas Standard Chartered fell short due to the absence of descriptive link texts.





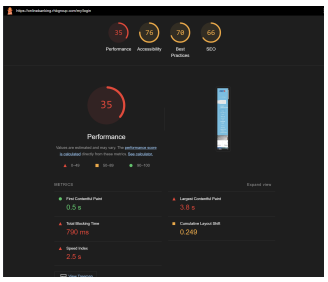


Fig.HSBC Audit Result Fig. MayBank Audit Result Fig. RHB Audit Result

Meanwhile, we chose three banks to compare for this section which are HSBC, Maybank and RHB since they showed at least one poor score. We can see in the Performance metric that Largest Contentful Paint, Total Blocking Time and Speed Index caused the score to be unanimously reduced. The common mistake in these banking websites is the unused Javascript and the JavaScript execution time taken for parsing, compiling and executing code. In terms of Accessibility, HSBC shone the most compared to the other two, only having one suggested remaek by Google Lighthouse which is to have accessible names for the buttons. While for Maybank and RHB, the similar comments were to have better contrast between the backgrounds and other elements and in addition to it, Maybank did not practice to provide [alt] to their elements. Moving on, the three banks in the Best Practice metrics received orange scores which highlights on the missing source maps for large first-party JavaScript and the third-party cookies. Onto the SEO, we see again that HSBC managed to get a green score of 100, similar to Bank Islam. The other two banks have their problems such as Maybank having uncrawlable links while the RHB website is not available on search engines, which can limit the usage of transactional matters efficiently.

Metrics	Standard Chartered	Bank Islam	HSBC Bank Malaysia	Maybank	RHB
Performance	74	78	34	37	35
Accessibility	92	96	94	52	76
Best Practices	74	96	52	70	70
SEO	92	100	100	69	66

Table 1: Google Lighthouse Banking Website Analysis Results

According to these results, we can see trends on the SEO that three banks achieved the standard required from the Google Lighthouse as optimized when searched via search engines. Besides, the scores in Performance are widely varied due to Blocking Time and Speed Index. The Best Practices metric is scored good only from Bank Islam's website while the rest received an orange score. As for Accessibility, Maybank's website scored the poorest and indicated that many good practices for user clarity were ignored.

Conclusion

In conclusion, our comparative studies using Google LightHouse between Malaysian banking websites show acceptable standards of digital functionality but there is still opportunity for improvement in a number of crucial areas. For instance, HSBC, Maybank and RHB showed substandard performance because of the network requests failing and missing source maps for large first-party JavaScript. Meanwhile, Standard Chartered and Bank Islam performed better with superior front-end optimization in terms of overall speed and visual stability. However, these websites have some common weaknesses such as missing source maps and uncrawlable links without proper attributes.

Recommendations

For Standard Chartered's website, it is encouraged to concentrate on improving its performance and enhancing security compliance which refer to the metrics of best practices. On average, Bank Islam's website has the best evaluation results compared to four other websites. Thus, continuous testing and codebase updates should be done regularly in order to maintain its current performance. For HSBC Bank Malaysia's website, there is room for enhancement in best practices and performance. For Maybank's website, we recommend to put more effort in optimizing its page load time and enhancing accessibility features, for instance better colour contrast for better user experience. Lastly, for RHB bank's website, it is recommended to focus on balanced optimization for all the metrics since the website lacks excellence in any single aspect.

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